Date: 6 January 2000
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 105-DR FSB - Concrete
Subject: Inorganics - Data Package No. H0483-RLN (SDG No. H0483)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H0483-RLN prepared by RECRA LabNet (RLN). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B0W3Y6	8/4/99	Solid	C	See note 1
B0W3Y7	8/4/99	Solid	C	See note 1

1 - ICP metals by 6010B (lead); mercury by 7471A

Data validation was conducted in accordance with the BHI validation statement of work and "Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils" (DOE/RL-99-35). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

  Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within six (6) months for lead and 28 days for mercury.

  All holding times were acceptable.

- **Blanks**

  Preparation Blanks

  At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

  In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the IDL and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

  All preparation blank results were acceptable.

- **Accuracy**

  Matrix Spike

  Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

  Due to a matrix spike recovery of 208%, all mercury results were qualified as estimates and flagged "J".

  Due to a matrix spike recovery of 60.7%, all lead results were qualified as estimates and flagged "J".

- **Precision**

  Laboratory Duplicate Samples

  Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 30% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 20% for positive sample results greater than five times the CRDL or plus or minus the CRDL for positive sample results less than five times the CRDL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

  All laboratory duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 105DR PQLs ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific PQL.

- **Completeness**

Data package No. H0483-RLN (SDG No. H0483) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to a matrix spike recovery of 208%, all mercury results were qualified as estimates and flagged "J". Due to a matrix spike recovery of 60.7%, all lead results were qualified as estimates and flagged "J". Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-99-35, *Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils*.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0483	REVIEWER: TLI	DATE: 1/6/00	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Lead	J	All	MS percent recovery
Mercury	J	All	MS percent recovery

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD																			
Laboratory: RECRA LabNet																			
Case	SDG: H0483																		
Sample Number		B0WY36		B0WY37															
Location		B		D															
Remarks																			
Sample Date		8/4/99		8/4/99															
Inorganics	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Mercury	0.08	1.0	J	0.35	J														
Lead	20	51.7	J	33.3	J														

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 08/12/99

CLIENT: TNU-HANFORD B99-076 RECRA LOT #: 9908L636

WORK ORDER: 10985-001-001-9999-00

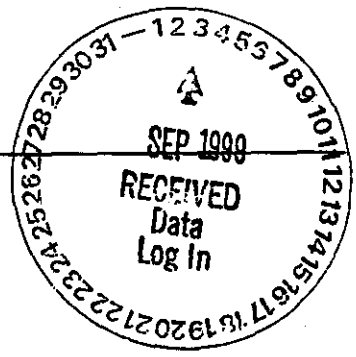
SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0W3Y6	Mercury, Total	1.0 J	MG/KG	0.03	1.0
		Lead, Total	51.7 J	MG/KG	1.4	5.0
-002	B0W3Y7	Mercury, Total	0.35 J	MG/KG	0.02	1.0
		Lead, Total	33.3 J	MG/KG	1.1	5.0

10/19/99

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

RECRA ENVIRONMENTAL INC.
Chemical and Environmental Measurement Information



Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-076
RFW# : 9908L636
SDG/SAF# : H0483/B99-076

W.O.# : 10985-001-001-9999-00
Date Received: 08-06-99

METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 solid samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. Five fold dilutions were performed for Lead due to the sample matrix.

3. All analyses were performed within the required holding times.

4. The cooler temperature has been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL) or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. The matrix spike (MS) recoveries for both analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A serial dilution is performed for Mercury. A PDS was prepared at the following concentration:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
B0W3Y6	Lead	200	105.2

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

12. The duplicate analysis for Mercury was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

13. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

8-12-99
Date

mld/m08-636

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-076-04	Page 1 of 1

Collector: Fahlberg/Nielson	Company Contact: J Adler	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ
Project Designation: 105-DR FSB - Concrete	Sampling Location: 105 DR		SAF No.: B99-076
Ice Chest No.: ERC 99-005	Field Logbook No.: EL 1281		Method of Shipment: Fed Ex
Shipped To: ~~IMA/RECRA~~ 8.2.99	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA
			COA: R105D4287Ø

Price Code: 9K (Q36)

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	Cool 4C	None										
Type of Container	aG	aG										
No. of Container(s) / Volume	1 / 60mL	1 / 60mL										
SAMPLE ANALYSIS	PCBs - 8080	ICP Metals - 6010A (Add-on) [Lead]; Mercury - 7471 - (CV)										

Sample No.	Matrix *	Sample Date	Sample Time									
B0W3Y6	Other Solid	8-4-99	0945	X	X						B0W0Y4	
B0W3Y7	Other Solid	8-4-99	0955	X	X						B0W0Y5	

CHAIN OF POSSESSION

Sign/Print Names		
Relinquished By: R. Fahlberg / R. Fahlberg	Date/Time: 1400 8.4.99	Received By: Ref 1-C
Relinquished By: R. Fahlberg / Ref 1-C	Date/Time: 0800 8.5.99	Received By: R. Fahlberg / R. Fahlberg
Relinquished By: R. Fahlberg / R. Fahlberg	Date/Time: 1400 8.5.99	Received By: Fed Ex
Relinquished By: Relinq	Date/Time:	Received By: Junction 5/10/00 Title: FC130

SPECIAL INSTRUCTIONS

Matrix *: Soil; Water; Vapor; Other Solid; Other Liquid

LABORATORY SECTION	Received By		Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	(C)	D	E
PROJECT: 105 DR FSB Concrete			DATA PACKAGE: H0483		
VALIDATOR:		LAB: Recker		DATE: 10/8/99	
CASE:			SDG: H0483		

ANALYSES PERFORMED					
☐ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☐ CLP/Cyanide	☐	☐
☒ SW-846/ICP	☐ SW-846/GFAA	☒ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX					
	B0W346	B0W347			
					Solid

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No (N/A)

Is a case narrative present? . . . . . (Yes) No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: _____

A-1/87

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments?	Yes	No	N/A
Are initial calibrations acceptable?	Yes	No	N/A
Are ICP interference checks acceptable?	Yes	No	N/A
Were ICV and CCV checks performed on all instruments?	Yes	No	N/A
Are ICV and CCV checks acceptable?	Yes	No	N/A

Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses?	Yes	No	N/A
Are ICB and CCB results acceptable?	Yes	No	N/A
Were preparation blanks analyzed?	Yes	No	N/A
Are preparation blank results acceptable?	Yes	No	N/A
Were field/trip blanks analyzed?	Yes	No	N/A
Are field/trip blank results acceptable?	Yes	No	N/A

Comments:

5. ACCURACY

Were spike samples analyzed?	Yes	No	N/A
Are spike sample recoveries acceptable?	Yes	No	N/A
Were laboratory control samples (LCS) analyzed?	Yes	No	N/A
Are LCS recoveries acceptable?	Yes	No	N/A

Comments: Hg 20r ↓J pb 60.7 ↑J

A-20

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed?	Yes	No	N/A
Are laboratory duplicate samples RPD values acceptable?	Yes	No	N/A
Were ICP serial dilution samples analyzed?	Yes	No	N/A
Are ICP serial dilution %D values acceptable?	Yes	No	N/A
Are field duplicate RPD values acceptable?	Yes	No	N/A
Are field split RPD values acceptable?	Yes	No	N/A

Comments:_____

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required?	Yes	No	N/A
Are duplicate injection %RSD values acceptable?	Yes	No	N/A
Were analytical spikes performed as required?	Yes	No	N/A
Are analytical spike recoveries acceptable?	Yes	No	N/A
Was MSA performed as required?	Yes	No	N/A
Are MSA results acceptable?	Yes	No	N/A

Comments:_____

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses?	Yes	No	N/A
Are all results supported in the raw data?	Yes	No	N/A
Are results calculated properly?	Yes	No	N/A
Do results meet the CRDLs?	Yes	No	N/A

Comments:_____

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 08/12/99

CLIENT: TNU-HANFORD B99-076 RECRA LOT #: 9908L636

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	BOW3Y6	Mercury, Total	1.5	1.0	0.26	208.1	1.0
		Lead, Total	94.1	51.7	69.8	60.7	5.0

304

Date: 6 January 2000
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: 105-DR FSB - Concrete
Subject: Radiochemistry - Data Package No. H0483-TNU (SDG No. H0483)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0483-TNU which was prepared by Thermo NUtech (TNU). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B0W3Y9	8/4/99	Solid	C	See note 1
B0W400	8/4/99	Solid	C	See note1
B0W401	8/4/99	Solid	C	See note 1

1 - Gamma spectroscopy; alpha spectroscopy (isotopic uranium, isotopic plutonium and americium-241); total strontium; nickel-63; tritium; carbon-14; technetium-99.

Data validation was conducted in accordance with the BHI validation statement of work and the "Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils" (DOE/RL-99-35). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

  Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months with liquid scintillation requiring analysis within 7 days of distillation.

  All holding times were acceptable.

- **Blanks**

  Laboratory Blanks

  Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the MDA, the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

  All laboratory blank results were acceptable although the laboratory reported detection limit exceeded the PQL for cobalt-60, cesium-137, europium-152, europium-154 and europium-155.

- **Accuracy**

  Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides.. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample and matrix spike recovery is 70-130% (gamma spectroscopy is 80-120%). In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

  Due to the lack of a matrix spike analysis, all carbon-14 and tritium results were qualified as estimates and flagged "J".

  Due to a radiochemical yield of 10%, the americium-241(aspec) results in sample B0W401 was qualified as an estimate and flagged "J".

  All other accuracy results were acceptable.

- **Precision**

  Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the CRDL and the RPD is less than

30 percent, the results are acceptable. If either activities are less then five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD of 47%, all carbon-14 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

- **Detection Levels**

  Reported analytical detection levels are compared against the 105DR PQLs to ensure that laboratory detection levels meet the required criteria. All reported laboratory MDAs were at or below the analyte-specific PQL.

- **Completeness**

  Data Package No. H0483 (SDG No. H0483) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of a matrix spike analysis, all carbon-14 and tritium results were qualified as estimates and flagged "J". Due to a radiochemical yield of 10%, the americium-241(aspec) results in sample B0W401 was qualified as an estimate and flagged "J". Due to an RPD of 47%, all carbon-14 results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-99-35, *Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils*.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0483	REVIEWER: TLI	DATE: 1/6/00	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Americium-241	J	B0W401	Radiochemical yield
Carbon-14	J	All	RPD
Carbon-14, tritium	J	All	No MS analysis

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																			
Laboratory: TNU																			
Case	SDG: H0483																		
Sample Number		B0W3Y9		B0W400		B0W401													
Location		A		C-1		C-2													
Remarks																			
Sample Date		08/04/99		08/04/99		08/04/99													
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Tritium	400	4.56	J	5.97	J	5.97	J												
Carbon-14	50	259	J	174	J	174	J												
Technetium-99	15	0.620		1.06		1.06													
Uranium-233/234	1	1.34		2.24		2.24													
Uranium-235	1	0.077		0.207		0.207													
Uranium-238	1	1.20		1.86		1.86													
Plutonium-238	1	4.99		2.58		2.58													
Plutonium-239/40	1	232		163		163													
Nickel-63	30	7580		4680		4680													
Americium-241	1	75.5		50.7		50.7	J												
Strontium (total)	1	2710		4700		4700													
Potassium-40		U	U	U	U	U	U												
Barium-133		U	U	U	U	U	U												
Cobalt 60	0.1	281		193		193													
Cesium 137	0.1	7790		11000		11000													
Europium 152	0.2	987		548		548													
Europium 154	0.2	226		113		113													
Europium 155	0.1	13.4		9.43		9.43													
Radium-226		U	U	U	U	U	U												
Radium-228		U	U	U	U	U	U												
Thorium-228		U	U	U	U	U	U												
Thorium-232		U	U	U	U	U	U												
Americium-241 (GEA)		108		100		100													
Uranium-238 (GEA)		U	U	U	U	U	U												
Uranium-235 (GEA)		U	U	U	U	U	U												

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

N908036-01 B0W3Y9

DATA SHEET

SDG 7170	Client/Case no Hanford	SDG-H0483	
Contact L.A. Johnson	Contract TRB-SBB-207925		
Lab sample id N908036-01	Client sample id B0W3Y9		
Dept sample id 7170-001	Location/Matrix 105 DR	SOLID	
Received 08/06/99	Collected 08/04/99 09:35		
	Custody/SAF No B99-076-05	B99-076	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	4.56	0.19	0.15	400	J	H
Carbon 14	14762-75-5	259	6.4	4.6	50	J	C
Technetium 99	14133-76-7	0.620	0.19	0.39	15	J	TC
Uranium 233/234	U-233/234	1.34	0.22	0.068	1.0		U
Uranium 235	15117-96-1	0.077	0.052	0.066	1.0	J	U
Uranium 238	U-238	1.20	0.21	0.054	1.0		U
Plutonium 238	13981-16-3	4.99	1.3	0.32	1.0		PU
Plutonium 239/240	PU-239/240	232	47	0.48	1.0		PU
Nickel 63	13981-37-8	7580	76	6.3	30		NI_L
Americium 241	14596-10-2	75.5	5.4	0.042	1.0		AM
Total Strontium	SR-RAD	2710	100	7.6	1.0		SR
Potassium 40	13966-00-2	U		5.4		U	GAM
Barium 133	13981-41-4	U		2.6		UX	GAM
Cobalt 60	10198-40-0	281	2.0	0.99	0.050		GAM
Cesium 137	10045-97-3	7790	7.0	2.5	0.10		GAM
Europium 152	14683-23-9	987	7.3	8.0	0.10		GAM
Europium 154	15585-10-1	226	4.1	3.3	0.10		GAM
Europium 155	14391-16-3	13.4	2.6	3.8	0.10		GAM
Radium 226	13982-63-3	U		3.1	0.10	U	GAM
Radium 228	15262-20-1	U		6.1	0.20	U	GAM
Thorium 228	14274-82-9	U		2.9		U	GAM
Thorium 232	TH-232	U		6.1		U	GAM
Americium 241	14596-10-2	108	1.8	2.3			GAM
Uranium 238	U-238	U		260		U	GAM
Uranium 235	15117-96-1	U		6.0		U	GAM

PRIORITY

105-DR FSB - Concrete

1/4/00

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/99

DATA SHEETS
Page 1
SUMMARY DATA SECTION
Page 15

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

N908036-02 B0W400

DATA SHEET

SDG 7170 Client/Case no Hanford SDG-H0483
Contact L.A. Johnson Contract TRR-SBB-207925

Lab sample id N908036-02 Client sample id B0W400
Dept sample id 7170-002 Location/Matrix 105 DR SOLID
Received 08/06/99 Collected 08/04/99 09:25
Custody/SAF No B99-076-05 B99-076

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	5.97	0.14	0.072	400	J	H
Carbon 14	14762-75-8	174	5.5	4.6	50	J	C
Technetium 99	14133-76-7	1.06	0.30	0.39	15		TC
Uranium 233/234	U-233/234	2.24	0.32	0.074	1.0		U
Uranium 235	15117-96-1	0.207	0.096	0.072	1.0		U
Uranium 238	U-238	1.86	0.29	0.074	1.0		U
Plutonium 238	13981-16-3	2.58	0.26	0.031	1.0		PU
Plutonium 239/240	PU-239/240	163	11	0.049	1.0		PU
Nickel 63	13981-37-8	4680	47	5.4	30		NI_L
Americium 241	14596-10-2	50.7	3.4	0.044	1.0		AM
Total Strontium	SR-RAD	4700	130	8.6	1.0		SR
Potassium 40	13966-00-2	U		5.7		U	GAM
Barium 133	13981-41-4	U		3.5		UX	GAM
Cobalt 60	10198-40-0	193	1.8	0.93	0.050		GAM
Cesium 137	10045-97-3	11000	10	3.5	0.10		GAM
Europium 152	14683-23-9	540	8.5	10	0.10		GAM
Europium 154	15585-10-1	113	3.4	3.1	0.10		GAM
Europium 155	14391-16-3	9.43	3.6	5.6	0.10		GAM
Radium 226	13982-63-3	U		4.1	0.10	U	GAM
Radium 228	15262-20-1	U		5.2	0.20	U	GAM
Thorium 228	14274-82-9	U		3.7		U	GAM
Thorium 232	TH-232	U		5.2		U	GAM
Americium 241	14596-10-2	100	5.3	7.6			GAM
Uranium 238	U-238	U		150		U	GAM
Uranium 235	15117-96-1	U		7.6		U	GAM

105-DR FSB - Concrete

PRIORITY

1/4/00

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 10/07/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

N9008036-03 B0W401

DATA SHEET

SDG 7170 Client/Case no Hanford SDG-H0483
Contact L.A. Johnson Contract TRB-SBB-207928

Lab sample id N9008036-03 Client sample id B0W401
Dept sample id 7170-003 Location/Matrix 105 DR SOLID
Received 08/06/99 Collected 08/04/99 09:09
Custody/SAF No B99-076-05 B99-076

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	6.46	0.15	0.073	400	J	H
Carbon 14	14762-75-5	3300	67	16	80	J	C
Technetium 99	14133-76-7	1.94	0.28	0.44	15	J	TC
Uranium 233/234	U-233/234	1.70	0.26	0.079	1.0		U
Uranium 235	15117-96-1	0.139	0.070	0.067	1.0	J	U
Uranium 238	U-238	2.61	0.34	0.069	1.0		U
Plutonium 238	13981-16-3	6.83	0.58	0.041	1.0		PU
Plutonium 239/240	PU-239/240	187	13	0.047	1.0		PU
Nickel 63	13981-37-8	10000	100	7.2	30		NI_L
Americium 241	14596-10-2	71.8	16	0.40	1.0	J	AM
Total Strontium	SR-RAD	3280	120	11	1.0		SR
Potassium 40	13966-00-2	U		6.5		U	GAM
Barium 133	13981-41-4	U		1.9		UX	GAM
Cobalt 60	10198-40-0	720	2.3	1.1	0.050		GAM
Cesium 137	10045-97-3	7540	5.0	1.9	0.10		GAM
Europium 152	14683-23-9	1280	6.0	5.9	0.10		GAM
Europium 154	15585-10-1	302	3.8	3.3	0.10		GAM
Europium 155	14391-16-3	12.4	1.8	3.0	0.10		GAM
Radium 226	13982-63-3	U		2.5	0.10	U	GAM
Radium 228	15262-20-1	U		5.5	0.20	U	GAM
Thorium 228	14274-82-9	U		1.9		U	GAM
Thorium 232	TH-232	U		5.5		U	GAM
Americium 241	14596-10-2	80.2	2.4	3.6			GAM
Uranium 238	U-238	U		200		U	GAM
Uranium 235	15117-96-1	U		4.8		U	GAM

PRIORITY

105-DR PSB - Concrete

1/4/00

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 10/07/99

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0483 is composed of three solid samples designated under SAF No. B99-076 with a Project Designation of : 105-DR FSB-Concrete.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the TNU Sample Receipt Checklist. The results were transmitted to BHI via facsimile on August 25, 1999.

2.0 ANALYSIS NOTES

2.1 Technetium-99 Analyses

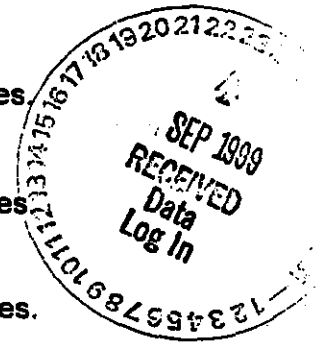
The RPD for the duplicate analysis was 59%, greater than the 3 sigma total of 51%. Positive Tc99 was detected in all the samples.

2.2 Total Strontium Analyses

All sample MDA's were greater than the RDL however all samples contained strontium activity much greater than the RDL and MDA. The blank sample indicated slight cross contamination.

2.3 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.



2.4 Tritium Analyses

No problems were encountered during the course of the analyses.

2.5 Gamma Spec Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses. Some Pu-239 activity was being counted in the ROI for the tracer Pu242 resulting in a apparently high tracer yield. The integration bounds for Pu239 were changed slightly in order to remove the Pu239 counts from the Pu242 ROI and the data recalculated. All data, except for the LCS and blank, was recalculated.

2.7 Americium-241 Analyses

No problems were encountered during the course of the analyses. Due to an unclear definition between the Am243 tracer peak and the Am241 peak in the alpha spectra of the samples the integration limits for Am241 were changed slightly to remove some of the Am243 counts and the data recalculated. All data, except for the LCS and blank, was recalculated.

2.8 Carbon-14 Analyses

The C14 recovery LCS for the initial analysis was unsatisfactory. A reanalysis was performed with an acceptable LCS recovery, however the RPD for duplicate analysis was 47%, greater than the 3 sigma total of 23%. Sample inhomegeneity is most likely the cause of the difference in the results.

2.9 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-076-05	Page 1 of 1

Collector: Fahlberg/Nielson	Company Contact: J Adler	Telephone No.: 373-4316	Project Coordinator: TRENT, SJ
Project Designation: 105-DR FSB - Concrete	Sampling Location: 105 DR		SAF No.: B99-076
Ice Chest No.: ERC 99-002	Field Logbook No.: EL 1281		Method of Shipment: Fed Ex
Shipped To: TMA/~~RECRA~~ R.F. 8-2-99	Offsite Property No.: NA		Bill of Lading/Air Bill No.: NA
			COA: R105D4-2870

Price Code: 9K

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None												
Type of Container	aG												
No. of Container(s)	1												
Volume	120mL												
SAMPLE ANALYSIS (See Item (1) in Special Instructions.)													

Sample No.	Matrix *	Sample Date	Sample Time										
B0W3Y9	Other Solid	8-4-99	0935	X						M.G	cpm 1400	B0W0X6	
B0W400	Other Solid	8-4-99	0925	X							cpm 1500	B0W0X7	
B0W401	Other Solid	8-4-99	0909	X							cpm 1700	B0W0X8	
											~~Specified~~		

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	8-4-99 1400	Ref 1-C	8-4-99 1400
Ref 1-C	8-5-99 0800	R. Fahlberg / R. Fahlberg	8-5-99 0800
R. Fahlberg / R. Fahlberg	8-5-99 1400	Fed Ex	8/5-99
Fed Ex	8-6-99 11:30	TNV M. Goldenberg	8-6-99 11:30

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; Technetium-99; Nickel-63; Carbon-14; Tritium - H3

Matrix *: Soil, Water, Vapor, Other Solid, Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Appendix 5

Data Validation Supporting Documentation

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 105-DR FSB Concrete			DATA PACKAGE: H0483		
VALIDATOR: TLI		LAB: TNU		DATE:	
CASE:			SDG: H0483		

ANALYSES PERFORMED

☒ Gross Alpha/Beta	☒ Strontium-90	☒ Technetium-99	☒ Alpha Spectroscopy	☒ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☒ Tritium	☒ C14	☒ Ni-63	

SAMPLES/MATRIX B0W349 B0W400 B0W401

Solid

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . Yes No (N/A)

Comments: _____

2. Initial Calibration . . . . . ☒ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . . Yes No N/A

Initial calibration acceptable? . . . . . Yes No N/A

Standards NIST traceable? . . . . . Yes No N/A

Standards Expired? . . . . . Yes No N/A

Comments: _____

3. Continuing Calibration . . . . . ☐ N/A

Calibration checked within one week of sample analysis? . . .	Yes	No	N/A
Calibration check acceptable?	Yes	No	N/A
Calibration check standards NIST traceable?	Yes	No	N/A
Calibration check standards expired?	Yes	No	N/A

Comments: _____

4. Blanks . . . . . ☐ N/A

Method blank analyzed?	(Yes)	No	N/A
Method blank results acceptable?	(Yes)	No	N/A
Analytes detected in method blank?	(Yes)	No	N/A
Field blank(s) analyzed?	Yes	(No)	N/A
Field blank results acceptable?	Yes	No	(N/A)
Analytes detected in field blank(s)?	Yes	No	(N/A)
Transcription/Calculation Errors?	Yes	No	(N/A)

Comments: SR-90 - all >5x ok
Eu - all on rDL

5. Matrix Spikes . . . . . ☐ N/A

Matrix spike analyzed?	Yes	(No)	N/A
Spike recoveries acceptable?	Yes	No	(N/A)
Spike source traceable?	Yes	No	(N/A)
Spike source expired?	Yes	No	(N/A)
Transcription/Calculation Errors?	Yes	No	(N/A)

Comments: IR

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed?	(Yes)	No	N/A
LCS recoveries acceptable?	(Yes)	No	N/A
LCS traceable?	Yes	No	(N/A)
Transcription/Calculation Errors?	Yes	No	(N/A)

Comments:

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added?	(Yes)	No	N/A
Chemical recovery acceptable?	Yes	(No)	N/A
Chemical carrier traceable?	Yes	No	(N/A)
Chemical carrier expired?	Yes	No	(N/A)
Transcription/Calculation errors?	Yes	No	(N/A)

Comments: Am 241 109% yield — Jall 401

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed?	(Yes)	No	N/A
RPD Values Acceptable?	Yes	(No)	N/A
Transcription/Calculation Errors?	Yes	No	(N/A)

Comments: ~~Tc-99 — Jall (592)~~ K
C-14 — Jall (477)
gamma - ~~Jall~~ dup count not a fraction of the orignal - OK

9. Field QC Samples . . . . . ☒ N/A

Field duplicate sample(s) analyzed?	Yes	No	N/A
Field duplicate RPD values acceptable?	Yes	No	N/A
Field split sample(s) analyzed?	Yes	No	N/A
Field split RPD values acceptable?	Yes	No	N/A
Performance audit sample(s) analyzed?	Yes	No	N/A
Performance audit sample results acceptable?	Yes	No	N/A

Comments:_____

10. Holding Times

Are sample holding times acceptable?	(Yes)	No	N/A

Comments:_____

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses?	(Yes)	No	N/A
Results supported in raw data?	Yes	No	(N/A)
Results Acceptable?	(Yes)	No	N/A
Transcription/Calculation errors?	Yes	No	(N/A)
MDA's meet required detection limits?	(Yes)	No	N/A
Transcription/calculation errors?	Yes	No	(N/A)

Comments:_____

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0463

N9808036-06

B0W3Y9

DUPLICATE

SDG 7170 | Client/Case no Hanford | SDG-H0463

Contact L.A. Johnson | Case no TRB-SRB-207925

DUPLICATE	ORIGINAL	
Lab sample id N9808036-06	Lab sample id N9808036-01	Client sample id B0W3Y9
Dept sample id 7170-006	Dept sample id 7170-001	Location/Matrix 105 DR SOLID
	Received 08/06/99	Collected 08/04/99 09:38
		Custody/SAF NO 899-076-05 899-076

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	ADL pCi/g	QUALIFIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALIFIERS	RPD %	3σ PROT TOT LIMIT
Tritium	4.63	0.19	0.15	400	J	H	4.56	0.19	0.15	J	2	23
Technetium 99	1.14	0.19	0.29	15	J	TC	0.620	0.19	0.39	J	59	51
Uranium 233/234	1.24	0.23	0.076	1.0		U	1.34	0.22	0.068		8	38
Uranium 235	0.066	0.058	0.073	1.0	J	U	0.077	0.052	0.066	J	11	144
Uranium 238	1.23	0.23	0.061	1.0		U	1.20	0.21	0.054		2	40
Plutonium 238	5.24	0.49	0.037	1.0		PU	4.99	1.3	0.32		5	42
Plutonium 239/240	227	16	0.060	1.0		PU	232	47	0.45		2	34
Nickel 63	7790	78	6.7	30		NI_L	7580	76	6.3		3	21
Americium 241	76.1	12	0.29	1.0		AM	75.5	5.4	0.042		1	28
Total Strontium	2720	89	4.3	1.0		SR	2710	100	7.6		0	22
Potassium 40	U		21		U	GAM	U		8.4	U	-	
Barium 133	U		7.0		UX	GAM	U		2.6	UX	-	
Cobalt 60	284	5.6	1.1	0.050		GAM	281	2.0	0.99		1	32
Cesium 137	8090	20	6.6	0.10		GAM	7730	7.0	2.5		4	32
Europium 152	959	20	23	0.10		GAM	987	7.3	8.0		3	32
Europium 154	242	12	10	0.10		GAM	226	4.1	3.2		7	33
Europium 155	U		15	0.10	U	GAM	13.4	2.6	3.8		11	164
Radium 226	U		8.6	0.10	U	GAM	U		3.1	U	-	
Radium 228	U		16	0.20	U	GAM	U		6.1	U	-	
Thorium 228	U		7.3		U	GAM	U		2.9	U	-	
Thorium 232	U		16		U	GAM	U		6.1	U	-	
Americium 241	87.9	12	16			GAM	108	1.8	2.3		21	37
Uranium 238	U		610		U	GAM	U		260	U	-	
Uranium 235	U		18		U	GAM	U		6.0	U	-	

105-DR FSE - Concrete

QC-DUP#1 31523

PRIORITY

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DUP-DUP
Version 1.06
Report date 10/07/99

Date: 6 January 2000
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 105-DR FSB Concrete
Subject: PCB - Data Package No. H0483-RLN (SDG No. H0483)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0483-RLN prepared by Recra LabNet (RLN). A list of the samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B0V3Y6	08/04/99	Solid	C	EPA 8082*
B0V3Y7	08/04/99	Solid	C	EPA 8082*

*Equivalent to the requested method (EPA 8080).

Data validation was conducted in accordance with the BHI validation statement of work and the "Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils" (DOE/RL-99-35). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

  Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

  If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ"

for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all nondetects are rejected and flagged "UR".

Holding times were met for all samples.

- **Blanks**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than CRQL. If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than CRQL, the result is qualified as undetected and elevated to the CRQL.

All method blank target compound results were acceptable.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike analyses are performed in duplicate and must be within control limits of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Nondetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to MS/MSD results of undetected or diluted out, all PCB results were qualified as estimates and flagged "J".

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified

as estimates and flagged "J". Nondetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Nondetected compounds with surrogate recoveries above the upper control limit require no qualification.

Due to a surrogate recovery outside QC limits, all PCB results in sample B0W3Y7 were qualfied as estimates and flagged "J".

Due to the surrogate being diluted out, all undetected PCB results in sample B0W3Y6 were rejected and flagged "UR" and all detected PCB results (aroclor-1254) were qualified as estimates and flagged "J".

All other surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the lack of a MS/MSD analysis, all PCB results were qualified as estimates and flagged "J".

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 105DR to ensure that laboratory detection levels meet the required criteria. All PCB results in sample B0W3Y6 (except aroclor 1254) were reported above the PQL. Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific PQL.

- **Completeness**

  Data Package No. H0483-RLN (SDG No. H0483) was submitted for validation and verified for completeness. The completion percentage was 57%.

MAJOR DEFICIENCIES

Due to the surrogate being diluted out, all undetected PCB results in sample B0W3Y6 were rejected and flagged "UR". Rejected data is unusable and should not be reported.

MINOR DEFICIENCIES

Due to MS/MSD results of undetected or diluted out, all PCB results were qualified as estimates and flagged "J". Due to a surrogate recovery outside QC limits, all PCB results in sample B0W3Y7 were qualfied as estimates and flagged "J". Due to the lack of a MS/MSD analysis, all PCB results were qualified as estimates and flagged "J". Due to the surrogate being diluted out, the detected PCB result (aroclor-1254) in sample B0W3Y6 was qualified as an estimate and flagged "J". Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All PCB results in sample B0W3Y6 (except aroclor 1254) were reported above the PQL. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-99-35, *Sample and Analysis Plan for 105F and 105DR Phase III Below Grade Structures and Underlying Soils*.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0483	REVIEWER: TLI	DATE: 1/6/00	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	All	MS/MSD diluted out
All	J	All	No duplicate analysis
All	J	B0W3Y7	Surrogate recovery
All except Aroclor-1254	UR	B0W3Y6	Surrogate diluted out
Aroclor-1254	J	B0W3Y6	Surrogate diluted out

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB ANALYSIS, SOLID MATRIX, (UG/KG)

Project: BECHTEL-HANFORD																							
Laboratory: Recra LabNet																							
Case	SDG: H0483																						
Sample Number		B0W3Y6		B0W3Y7																			
Location		B		D																			
Remarks																							
Sample Date		08/04/99		08/04/99																			
PCB	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	100	510	UR	40	UJ																		
Aroclor-1221	100	1000	UR	79	UJ																		
Aroclor-1232	100	510	UR	40	UJ																		
Aroclor-1242	100	510	UR	40	UJ																		
Aroclor-1248	100	510	UR	40	UJ																		
Aroclor-1254	100	810	J	40	UJ																		
Aroclor-1260	100	510	UR	40	UJ																		

Recra LabNet - Lionville Laboratory

PCBs by GC

Report Date: 08/17/99 11:22

RFW Batch Number: 9908L636 Client: TNU-HANFORD B99-076 Work Order: 10985001001 Page: 1

	Cust ID:	B0W3Y6	B0W3Y6	B0W3Y6	B0W3Y7	PBLKQT	PBLKQT BS
Sample Information	RFW#:	001	001 MS	001 MSD	002	99LE0927-MB1	99LE0927-MB1
	Matrix:	SOLID	SOLID	SOLID	SOLID	SOIL	SOIL
	D.F.:	10.0	10.0	10.0	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	D %	D %	D %	100 %	108 %	75 %
	Decachlorobiphenyl	D %	D %	D %	137 * %	109 %	80 %
Aroclor-1016		510 U R	1000 U	1000 U	40 U J	33 U	33 U
Aroclor-1221		1000 U R	2000 U	2100 U	79 U	67 U	67 U
Aroclor-1232		510 U R	1000 U	1000 U	40 U	33 U	33 U
Aroclor-1242		510 U R	1000 U	1000 U	40 U	33 U	33 U
Aroclor-1248		510 U R	1000 U	1000 U	40 U	33 U	33 U
Aroclor-1254		810 J	D %	D %	40 U	33 U	75 %
Aroclor-1260		510 U R	1000 U	1000 U	40 U	33 U	33 U

0004

0000211

12/15/99

08-17-99

Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked. Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client: TNU-HANFORD B99-076
RFW#: 9908L636
SDG/SAF#: H0483/B99-076

W.O.#: 10985-001-001-9999-00
Date Received: 08-06-99

PCB

The set of samples consisted of two (2) solid samples collected on 08-04-99.

The samples and their associated QC samples were extracted on 08-10-99 and analyzed according to Recra OPs based on SW846, 3rd Edition procedures on 08-11,12-99. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclor only.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature has been recorded on the chain-of-custody.

2. All required holding times for extraction and analysis have been met.

3. The samples and their associated QC samples received a sulfuric acid and sulfur cleanup.

4. The method blank was below the reporting limits for all target compounds.

5. One (1) of six (6) obtainable surrogate recoveries were outside QC limits; however, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample).

6. The blank spike recovery was within acceptance criteria.

7. Matrix spike recoveries were unobtainable due to high concentration of analytes and the dilution required for analysis.

8. Sample BOW3Y6 and its QC samples required ten-fold instrument dilutions due to high concentrations of target analytes. Reporting limits have been adjusted to reflect the necessary dilutions.

9. All initial calibrations associated with this data set were within acceptance criteria.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

RS 7 J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

08-18-99
Date

pef\r:\group\data\pest\08L-636.pcb

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-076-04	Page 1 of 1

Collector: Fahlberg/Nielson	Company Contact: J Adler — Telephone No.: 373-4316	Project Coordinator: TRENT, SJ	Price Code: 9K (036) — Data Turnaround: 15 Days
Project Designation: 105-DR FSB - Concrete	Sampling Location: 105 DR	SAF No.: B99-076	
Ice Chest No.: ERC 99-005	Field Logbook No.: EL 1281	Method of Shipment: Fed Ex	
Shipped To: TMA/RECRA RE 8.3.99	Offsite Property No.: NA	Bill of Lading/Air Bill No.: NA	
		COA: R105D42870	

POSSIBLE SAMPLE HAZARDS/REMARKS												
	Preservation	Cool 4C	None									
	Type of Container	aG	aG									
Special Handling and/or Storage	No. of Container(s) / Volume	1 / 60mL	1 / 60mL									
SAMPLE ANALYSIS		PCBs - 8080	ICP Metals - 6010A (Add-on) (Lead); Mercury - 7471 - (CV)									

Sample No.	Matrix *	Sample Date	Sample Time									
B0W3Y6	Other Solid	8-4-99	0945	X	X						B0W0Y4	
B0W3Y7	Other Solid	8-4-99	0955	X	X						B0W0Y5	

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By	R. Fahlberg / R. Fahlberg	8-4-99 1400
Received By	Ref 1-C	8-4-99 1400
Relinquished By	R. Fahlberg / Ref 1-C	8-5-99 0800
Received By	R. Fahlberg / R. Fahlberg	8-5-99 0800
Relinquished By	R. Fahlberg / R. Fahlberg	8-5-99 1400
Received By	Fed Ex	
Relinquished By	Nelley	
Received By	Johnson	9/6/99 0830

SPECIAL INSTRUCTIONS

Matrix *: Soil; Water; Vapor; Other Solid; Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

57.0004

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 105-DR FSB concrete			DATA PACKAGE: H0483		
VALIDATOR:		LAB: Recra		DATE: 10/8/91	
CASE:			SDG: H0483		
ANALYSES PERFORMED					
☐ CLP3/90	☐ SW-846 8080	☐ SW-846 8081	☒ SW 8082	☐	☐
SAMPLES/MATRIX	B0W346	B0W347			
			Soil		

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No N/A

Is a case narrative present? . . . . . Yes No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes No N/A

Comments: _____

14 +40 4 of 2

8/4/91

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (METHOD 8080 AND 8081)

Are DDT retention times acceptable . . . . . Yes No N/A

Are calibration standard retention times acceptable? . . . . . Yes No N/A

Are DDT and endrin breakdowns acceptable? . . . . . Yes No N/A

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are DBC retention times acceptable? . . . . . Yes No N/A

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

Comments:_____

3.2 CALIBRATIONS (METHOD 8080 AND 8081)

Are EVAL standard calibration factors and %RSD values acceptable? . . . . . Yes No N/A

Are quantitation column calibration factor %RSD values acceptable? . . . . . Yes No N/A

Were the analytical sequence requirements met? . . . . . Yes No N/A

Are continuing calibration %D values acceptable? . . . . . Yes No N/A

Comments:_____

3.3 INSTRUMENT PERFORMANCE AND INITIAL CALIBRATION (3/90 SOW)

Was the initial calibration sequence performed? . . . . . Yes No N/A

Was the resolution acceptable in the resolution check mix? . . Yes No N/A

Is resolution acceptable in the PEM, INDA and INDB? . . . . . Yes No N/A

Are DDT and Endrin breakdowns acceptable? . . . . . Yes No N/A

Are retention times in PEMs and calibration mixes acceptable? . Yes No N/A

Are RPD values in the PEMs acceptable? . . . . . Yes No N/A

Are %RSD values acceptable? . . . . . Yes No N/A

Comments:_____

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Were the analytical sequence requirements met? . . . . . Yes No N/A

Is resolution acceptable in the PEMs? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are retention times acceptable in the PEMs, INDA and INDB mixes?	Yes	No	N/A
Are RPD values in the PEMs acceptable?	Yes	No	N/A
Are the DDT and endrin breakdowns acceptable?	Yes	No	N/A
Was GPC cleanup performed?	Yes	No	N/A
Is the GPC calibration check acceptable?	Yes	No	N/A
Was Florisil cleanup performed?	Yes	No	N/A
Is the Florisil performance check acceptable?	Yes	No	N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed?	Yes	No	N/A
Are laboratory blank results acceptable?	Yes	No	N/A
Were field/trip blanks analyzed?	Yes	No	N/A
Are field/trip blank results acceptable?	Yes	No	N/A

Comments:

5. ACCURACY

Were surrogates analyzed?	Yes	No	N/A
Are surrogate recoveries acceptable?	Yes	No	N/A
Were MS/MSD samples analyzed?	Yes	No	N/A
Are MS/MSD results acceptable?	Yes	No	N/A
Were LCS samples analyzed?	Yes	No	N/A
Are LCS results acceptable?	Yes	No	N/A

Comments:
decachlorobiphenyl out 47 J all 47
MS/MSD — 3 a dilution out

PESTICIDE/PCB DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . Yes (No) N/A

Are laboratory duplicate results acceptable? . . . . . Yes No (N/A)

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: U on diluted out - J

7. SYSTEM PERFORMANCE

Is chromatographic performance acceptable? . . . . . Yes No N/A

Are positive results resolved acceptably? . . . . . Yes No N/A

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . (Yes) No N/A

Are all results supported in the raw data? . . . . . Yes No (N/A)

Do results meet the CRQLs? . . . . . Yes (No) N/A

Comments: BOW346 all but 1254 ok

A-8

075769

Job No. 22192
Written Response Required: NO
Due Date: N/A
Actionee: N/A
Closes CCN: N/A
OU: N/A
TSD: N/A
ERA: N/A
Subject Code: 8620

Environmental Restoration Contractor **ERC Team**

Interoffice Memorandum

TO: J.G. Adler X5-53
R.S. Day X5-53
M.R. Morton X9-08

DATE: January 24, 2000

COPIES: J.M. Duncan H9-03
Document and Info Services H0-09

FROM: R.L. Weiss RLW
Sample Management
H9-03/372-9592

SUBJECT: **VALIDATION OF POLYCHLORINATED BIPHENYLS (PCB) ANALYSIS FOR SAMPLE DELIVERY GROUPS (SDG) H0475 & H0483**

Analysis for PCBs was performed on samples in SDGs H0475 & H0483. During analysis, levels of one PCB mixture (Aroclor-1254) were determined initially above the upper calibration range for three samples (SDG H0475 – B0W0Y2 & B0W0Y3, SDG H0483 – B0W3Y6). In order to bring the analytical solution within the instrument calibration range for this Aroclor, a 10-fold dilution of the primary solutions were performed. This dilution has resulted in inappropriate validation parameters being applied to the non—detect results reported for these samples.

One component of quality control (QC) associated with analysis of PCBs includes addition of "surrogate" compounds to the sample prior to any sample preparation for analysis. Surrogate materials are expected to follow through sample preparation and analysis very similarly to the target compounds. Poor or non-recovery of the surrogates may indicate potential failure of the methodology to determine presence and concentrations of the target compounds. Because surrogates are very similar to the materials they mimic, surrogates are added (spiked) at levels within the normal calibration range for the target compounds. Most often, spiking levels are only 5 to 10 times the method detection limits (this gives the most "robust" data when attempting to establish non-detection for compounds). When the primary sample preparation must be diluted, the resulting levels of surrogate compound may be reduced below the detection limit of the equipment. This occurred in the analysis of the samples noted above.

The current validation procedure ("Data Validation Procedures for Chemical Analysis", WHC-SD-EN-WPP-002) used by the ERC to validate PCB analysis does not correctly address validation when the primary sample preparation must be diluted before final analysis. The wording of the procedure is:

> "Qualify all associated detected results as estimated (J) and non-detects as unusable (R) for surrogate recoveries <10%"

Application of this requirement on the data for sample B0W3Y6, B0W0Y2 AND B0W0Y3 resulted in applying the "J" flag to the Aroclor-1254 result and "R" flag to all others (non-detects).

The procedure used for ERC data is based on the "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", EPA540/R94/012. This document provides different guidance when validating PCB data when sample dilution is required. The wording of that document is:

> "If low surrogate recoveries are found to be due to sample dilution, then professional judgement should be used to determine if the resulting data should be qualified. If sample dilution is not a factor, then detected target compounds may be qualified "J" and non-detected target compound results should be qualified unusable (R)."

The error in the procedure will be corrected as part of ongoing revision activities planned for the validation procedures occurring this year.

The non-detect results for samples B0W0Y2, B0W0Y3, & B0W3Y6 should not be considered to be unusable. The methodology has demonstrated the ability to detect Aroclor-1254. The presence of this PCB mixture has raised the detection limits for the other Aroclors, but should still be adequate to detect these materials if present. The "J" qualifier (estimated result but useable) is more appropriate for all PCB results for these samples.

RLW:dmr

REVIEW OF VALIDATION PACKAGES – R.L. WEISS - JAN. 13, 2000

105-DR FSB

SDG H0551 – Inorganic & PCB packages: no comment, OK
Radiochemistry package: Pages 3 & 4 (Detection Levels) – comment regarding missed DL requirement for Cs-137 in sample B0WCJ8 not appropriate, laboratory reported detected for this isotope.

SDG H0542 – Inorganic &PCB packages: no comment, OK
Radiochemistry package: Page 2 (Laboratory Blanks, 2nd paragraph); Incorrect isotopes ("uranium"-152, "uranium"-154, "uranium"-155) identified, probably should be Europium isotopes.

SDG H0538 – Inorganic &n PCB packages: no comment, OK
Radiochemistry package: Page 2 (Laboratory Blanks, 2nd paragraph); Delete this section, this project has no PQL for U-238 by GEA.

SDG H0483 –Inorganic & radiochemistry packages: no comment, OK
PCB package: additional information requested from laboratory for surrogate results for B0V3Y6. If data available, revision of package will be requested.

dk
correct
RLW

SDG H0472 Inorganic, PCB, & Radiochemistry packages: no comments, OK

100-D AREAS

SDG H0514 – Inorganic package: no comment, OK

SDG H0505 – Inorganic package: no comment, OK
Radiochemistry package: Page 3 &4: Detection Levels; missed TDLs for U-238, U-235 for samples B0W653, B0W654, B0W657 should be identified as "(GEA)".

SDG H0490 – Radiochemistry package: no comment, OK

SDG H0553 – Inorganic & Radiochemistry packages: no comment, OK

SDG H0533 – Inorganic & Radiochemistry packages: no comment, OK
PCB package: additional information requested from laboratory for surrogate results for B0WBX6. If data available, revision of package will be requested.

P.5/6

Review Comment Record (RCR)

1. Date	2. Review No.
1/17/00	BHI/QA0006
3. Project	**4. Page**
105-DR	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
SDG No. H0483	105-DR FSB - Concrete	Claude Stacey	BHI/QA	H0-16/372-9208

17. Comment Submittal Approval: _____ Organization Manager (Optional) _____ Date

10. Agreement with indicated comment disposition(s) _____ Reviewer/Point of Contact _____ Date _____ Author/Originator

11. CLOSED 1/20/00 Date — C. Stacey Reviewer/Point of Contact — Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Inorganic: Page 002, Matrix Spike states the matrix spike recoveries must fall between 75 to 125%. The SAP (DOE/RL-99-35) page II-7 list the % recovery for accuracy as 70 to 130%. In addition, the SAP has the precision criteria as ±30%; whereas, the validation report page 3 has it as 35%.		corrected	
2	PCB: Page 02, Accuracy, Matrix Spike has the control limits as 50 to 150%; whereas, the SAP has Accuracy limits as 70 to 130%. In addition, on page 03, Precision has acceptance limits for the RPD as 35%; whereas, the SAP has the limit as 30%		Corrected	
3	Radiochemistry: Page 002, Accuracy has limits as 70 – 130 for LCS and 60 – 140 for MS. These limits per the SAP should be 80 – 120 or 70 – 130 depending on the type of analysis. In addition, under precision the limit is specified as 35%; whereas, the SAP specifies 30%.		corrected	
	Radiochemistry: Page 010, several of the PQLs listed are in error. Co-60, Cs-137 and Eu-155 are listed as 0.05; whereas, the SAP list the PQLs as 0.1. PQLs for Eu – 152 and 154 are listed as 0.1 on page 010 of the validation report; whereas, the SAP list the PQLs as 0.2		corrected	
	For Sample Management: There is a discrepancy on the chain of custody's associated with these samples that needs to be corrected. In the box where it has "Shipped To" the date is 8-2-99; where as, down below in the sample date block the sample date is 8-4-99. It would appear that the samples were shipped two days before sampling.			

REVIEW OF VALIDATION PACKAGES – R.L. WEISS - JAN. 13, 2000

105-DR FSB

SDG H0551 – Inorganic & PCB packages: no comment, OK
Radiochemistry package: Pages 3 & 4 (Detection Levels) – comment regarding missed DL requirement for Cs-137 in sample B0WCJ8 not appropriate, laboratory reported detected for this isotope.

SDG H0542 – Inorganic &PCB packages: no comment, OK
Radiochemistry package: Page 2 (Laboratory Blanks, 2nd paragraph); Incorrect isotopes ("uranium"-152, "uranium"-154, "uranium"-155) identified, probably should be Europium isotopes.

SDG H0538 – Inorganic &n PCB packages: no comment, OK
Radiochemistry package: Page 2 (Laboratory Blanks, 2nd paragraph); Delete this section, this project has no PQL for U-238 by GEA.

SDG H0483 –Inorganic & radiochemistry packages: no comment, OK
PCB package: additional information requested from laboratory for surrogate results for B0V3Y6. If data available, revision of package will be requested.

SDG H0472 Inorganic, PCB, & Radiochemistry packages: no comments, OK

100-D AREAS

SDG H0514 – Inorganic package: no comment, OK

SDG H0505 – Inorganic package: no comment, OK
Radiochemistry package: Page 3 &4: Detection Levels; missed TDLs for U-238, U-235 for samples B0W653, B0W654, B0W657 should be identified as "(GEA)".

SDG H0490 – Radiochemistry package: no comment, OK

SDG H0553 – Inorganic & Radiochemistry packages: no comment, OK

SDG H0533 – Inorganic & Radiochemistry packages: no comment, OK
PCB package: additional information requested from laboratory for surrogate results for B0WBX6. If data available, revision of package will be requested.

Review Comment Record (RCR)

1. Date	2. Review No.
1/17/00	BHI/QA0006
3. Project	**4. Page**
105-DR	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
SDG No. H0483	105-DR FSB - Concrete	Claude Stacey	BHI/QA	H0-16/372-9208

17. Comment Submittal Approval:

Organization Manager (Optional) _____ Date _____

10. Agreement with indicated comment disposition(s)

Reviewer/Point of Contact _____ Date _____

Author/Originator _____

11. CLOSED

Reviewer/Point of Contact _____ Date _____

Author/Originator _____

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/ resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Inorganic: Page 002, Matrix Spike states the matrix spike recoveries must fall between 75 to 125%. The SAP (DOE/RL-99-35) page II-7 list the % recovery for accuracy as 70 to 130%. In addition, the SAP has the precision criteria as ±30%; whereas, the validation report page 3 has it as 35%.			
2	PCB: Page 02, Accuracy, Matrix Spike has the control limits as 50 t0 150%; whereas, the SAP has Accuracy limits as 70 to 130%. In addition, on page 03, Precision has acceptance limits for the RPD as 35%; whereas, the SAP has the limit as 30%			
3	Radiochemistry: Page 002, Accuracy has limits as 70 – 130 for LCS and 60 – 140 for MS. These limits per the SAP should be 80 – 120 or 70 – 130 depending on the type of analysis. In addition, under precision the limit is specified as 35%; whereas, the SAP specifies 30%.			
	Radiochemistry: Page 010, several of the PQLs listed are in error. Co-60, Cs-137 and Eu-155 are listed as 0.05; whereas, the SAP list the PQLs as 0.1. PQLs for Eu – 152 and 154 are listed as 0.1 on page 010 of the validation report; whereas, the SAP list the PQLs as 0.2			
	For Sample Management: There is a discrepancy on the chain of custody's associated with these samples that needs to be corrected. In the box where it has "Shipped To" the date is 8-2-99; where as, down below in the sample date block the sample date is 8-4-99. It would appear that the samples were shipped two days before sampling.			

FAX

TECHLAW, INC.

451 Hills, Suite 23
Richland, WA 99352
509-375-5667
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 7 October 1999

Information Request

H0483 - Rad

There is no indication of a matrix spike for 3H, C-14

BHI Sample Management
Phone: (509) 372-9346
FAX: (509) 372-9487

facsimile transmittal

To: Bruce Christian Fax: 375-5151

From: Rich Weiss Date: 10-20-99

Re: Count data Pages: 3

CC:

☐ Quick Turn / Priority Data ☐ Final Data Package

Bruce

Look this over for places is the procedure that I've missed and for areas that make validation either "blow up" or would apply more restrictive qualifiers than currently

Rich

Inconsistencies and inadequately defined criteria have been identified in "Data Validation Procedures for Radiochemical Analysis", WHC-SD-EN-SPP-001, Rev.1. The following identifies the affected sections, provides a consistent replacement, and clarifies interpretation for these issues.

Laboratory Blanks

Current Wording (by section):

4.3.1 - Prepared at the same time and analyzed with the samples using the same procedure.

5.3.1 - Prepared at the same time and analyzed with the samples using the same procedure.

6.3.1 - Prepared at the same time and analyzed with the samples using the same procedure, aliquot size, and counting time.

5.3.1 – Analyzed using a similar aliquot size, counted in the same geometry and count time as the samples.

7.3.1 - Prepared at the same time and analyzed with the samples using the same procedure.

8.3.1 – Laboratory blanks have been prepared, distilled and analyzed using the same procedure and aliquot size as the samples.

9.3.1 - Prepared at the same time and analyzed in the same batch, using the same procedure, as the associated samples.

Laboratory Control or Blank Spike Samples

Current Wording (by section):

4.4.1 - Prepared at the same time and analyzed in the same batch, using the same procedure, as the associated samples.

5.4.1 - Prepared at the same time and analyzed in the same batch, using the same procedure, as the associated samples.

6.4.1 - Prepared at the same time and analyzed in the same batch, using the same procedure, as the associated samples.

7.4.1 – LCS of BSS was analyzed in the same geometry, count duration, and aliquot size as the samples.

8.4.1 - Prepared at the same time and analyzed in the same batch, using the same procedure, as the associated samples.

9.4.1 - Prepared at the same time and analyzed in the same batch, using the same procedure, as the associated samples.

Matrix Spike Samples

Current Wording (by section):

Section 4 - no matrix spike requirements

5.4.3 - Prepared at the same time and analyzed in the same batch, using the same procedure, as the associated samples.

6.4.3 - Prepared at the same time and analyzed in the same batch, using the same procedure, as the associated samples.

Section 7 – no matrix spike requirements.

8.4.3 - Prepared at the same time and analyzed in the same batch, using the same procedure, as the associated samples.

Section 9 – no matrix spike requirements.

Laboratory Duplicates

Current Wording (by section):

4.5.1 – The duplicate analysis was prepared and analyzed in the same batch, using the same procedure as the associated samples.

5.5.1 – The duplicate analysis was prepared and analyzed in the same batch, using the same procedure as the associated samples.

6.5.1 – The duplicate analysis was prepared and analyzed in the same batch, using the same procedure as the associated samples.

7.5.1 – The duplicate analysis was prepared and analyzed at the same time, using the same geometry, aliquot size and count duration as the samples.

8.5.1 – Prepared and analyzed using the same aliquot size as the samples.

9.5.1 – The duplicate analysis was prepared and analyzed in the same batch, using the same procedure as the associated samples.

Replacement Wording (all sections above):

Preparation performed as part of an analytical batch, at the same time, using the same procedures and aliquot sizes as the associated samples. All components of the analytical batch (QC and sample) counted using the same or comparable geometry and count duration within a two week time period.

Laboratory failure to meet the criteria (in any section) – qualify all associated sample results as estimated (J for detects, UJ for non-detects).

TRANSMISSION RESULT REPORT (OCT 20 '99 11:32AM)

BHI S&D MANAGEMENT 509 372 9487

(AUTO)

THE FOLLOWING FILE(S) ERASED

FILE	FILE TYPE	OPTION	TEL NO.	PAGE	RESULT
057	MEMORY TX		3755151	03/03	OK

ERRORS

1) HANG UP OR LINE FAIL 2) BUSY 3) NO ANSWER 4) NO FACSIMILE CONNECTION

BHI Sample Management
Phone: (509) 372-9346
FAX: (509) 372-9487

facsimile transmittal

To: Bruce Christian Fax: 375-5151

From: Rich Weiss Date: 10-20-99

Re: Count data Pages: 3

CC:

☐ Quick Turn / Priority Data ☐ Final Data Package

Bruce

Look this over for places in the

SAF-B99-076
21 DAY PRIORITY PACKAGE

FAX RESULTS TO:

Jason Adler 373-7719 _____ 10-8-99
INITIAL/DATE

VERIFICATION OF CLIENT RECEIPT:

Phone or CC:Mail to Jason Adler _____ 10-8-99
INITIAL/DATE

COMPLETE COPY OF DATA PACKAGE TO:

Jason Adler X5-53 _____ 10-8-99
INITIAL/DATE

COMMENTS: (PLEASE INCLUDE THE FOLLOWING ON THE FAX COVER SHEET)

SDG H0483 SAF-B99-076

☑ Rad only ☐ Chem only ☐ Rad & Chem

☐ Complete ☑ Partial

This includes the Ba 133 data -

2030 Wright Avenue
P.O. Box 4040
Richmond, CA 94804-0040
(510) 235-2633 • FAX (510) 235-0438

Facsimile Cover Sheet

Date: 10-7-99

TO: Company Name: BHI

Individual: JOHN KESSNER

Fax Number: _____

Telephone #: _____

FROM: KEVIN JOHNSON

Number of pages being sent (including this page): 14

☎ **PRIORITY**

IF YOU DO NOT RECEIVE ALL OF THIS TRANSMISSION, PLEASE CALL THE FACSIMILE OPERATOR AT (510) 235-2633.

Operator Name: KJ

Comments: Dear Joan,

Here is a new report For SDA H0463 which incorporates Barium data that was omitted From the original report.

I apologize for the inconvenience.

Kevin

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

WORK SUMMARY

SDG 7170
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0483

IENT SAMPLE ID / CATION / STODY	SAP No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
[illegible]			N908036-01	7170-001	AM		08/19/99	08/25/99	NJV	Americium 241 in Soil
5 DR		SOLID	08/04/99	7170-001	C	A1	08/20/99	08/25/99	NJV	Carbon 14 in Soil
9-076-05	B99-076		08/06/99	7170-001	GAM		08/17/99	08/24/99	NJV	Gamma Scan
				7170-001	H		08/14/99	08/23/99	NJV	Tritium in Soil
				7170-001	NI_L		08/13/99	08/25/99	NJV	Nickel 63 in Soil
				7170-001	PU		08/21/99	08/25/99	NJV	Plutonium, Isotopic in Solids
				7170-001	SR		08/16/99	08/24/99	NJV	Total Strontium in Soil
				7170-001	TC		08/23/99	08/25/99	NJV	Technetium 99 in Soil
				7170-001	U		08/13/99	08/24/99	NJV	Uranium, Isotopic in Soil
0W400			N908036-02	7170-002	AM		08/19/99	08/25/99	NJV	Americium 241 in Soil
05 DR		SOLID	08/04/99	7170-002	C	A1	08/21/99	08/25/99	NJV	Carbon 14 in Soil
99-076-05	B99-076		08/06/99	7170-002	GAM		08/17/99	08/24/99	NJV	Gamma Scan
				7170-002	H		08/14/99	08/23/99	NJV	Tritium in Soil
				7170-002	NI_L		08/13/99	08/25/99	NJV	Nickel 63 in Soil
				7170-002	PU		08/18/99	08/25/99	NJV	Plutonium, Isotopic in Solids
				7170-002	SR		08/16/99	08/24/99	NJV	Total Strontium in Soil
				7170-002	TC		08/23/99	08/25/99	NJV	Technetium 99 in Soil
				7170-002	U		08/13/99	08/24/99	NJV	Uranium, Isotopic in Soil
0W401			N908036-03	7170-003	AM		08/21/99	08/25/99	NJV	Americium 241 in Soil
05 DR		SOLID	08/04/99	7170-003	C	A1	08/21/99	08/25/99	NJV	Carbon 14 in Soil
99-076-05	B99-076		08/06/99	7170-003	GAM		08/17/99	08/24/99	NJV	Gamma Scan
				7170-003	H		08/15/99	08/23/99	NJV	Tritium in Soil
				7170-003	NI_L		08/13/99	08/25/99	NJV	Nickel 63 in Soil
				7170-003	PU		08/18/99	08/25/99	NJV	Plutonium, Isotopic in Solids
				7170-003	SR		08/16/99	08/24/99	NJV	Total Strontium in Soil
				7170-003	TC		08/23/99	08/25/99	NJV	Technetium 99 in Soil
				7170-003	U		08/13/99	08/24/99	NJV	Uranium, Isotopic in Soil
Method Blank			N908036-05	7170-005	AM		08/17/99	08/25/99	NJV	Americium 241 in Soil
		SOLID		7170-005	GAM		08/18/99	08/24/99	NJV	Gamma Scan
	B99-076			7170-005	H		08/15/99	08/23/99	NJV	Tritium in Soil
				7170-005	NI_L		08/13/99	08/25/99	NJV	Nickel 63 in Soil
				7170-005	PU		08/17/99	08/25/99	NJV	Plutonium, Isotopic in Solids
				7170-005	SR		08/16/99	08/24/99	NJV	Total Strontium in Soil
				7170-005	TC		08/21/99	08/25/99	NJV	Technetium 99 in Soil
				7170-005	U		08/13/99	08/24/99	NJV	Uranium, Isotopic in Soil

PRIORITY

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 10/07/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

WORK SUMMARY, cont.

SDG 7170
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0483

CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUFFIX	ANALYZED	REVIEWED	BY	METHOD
ithod Blank	B99-076	SOLID	N908036-08	7170-008	C		08/20/99	08/25/99	NJV	Carbon 14 in Soil
ab Control Sample	B99-076	SOLID	N908036-04	7170-004	AM		08/17/99	08/25/99	NJV	Americium 241 in Soil
				7170-004	GAM		08/18/99	08/24/99	NJV	Gamma Scan
				7170-004	H		08/15/99	08/23/99	NJV	Tritium in Soil
				7170-004	NI_L		08/13/99	08/25/99	NJV	Nickel 63 in Soil
				7170-004	PU		08/17/99	08/25/99	NJV	Plutonium, Isotopic in Solids
				7170-004	SR		08/16/99	08/24/99	NJV	Total Strontium in Soil
				7170-004	TC		08/20/99	08/25/99	NJV	Technetium 99 in Soil
				7170-004	U		08/13/99	08/24/99	NJV	Uranium, Isotopic in Soil
ab Control Sample	B99-076	SOLID	N908036-07	7170-007	C		08/21/99	08/25/99	NJV	Carbon 14 in Soil
Duplicate (N908036-01)	B99-076	SOLID	N908036-06	7170-006	AM		08/22/99	08/25/99	NJV	Americium 241 in Soil
105 DR			08/04/99	7170-006	GAM		08/18/99	08/24/99	NJV	Gamma Scan
			08/06/99	7170-006	H		08/15/99	08/23/99	NJV	Tritium in Soil
				7170-006	NI_L		08/13/99	08/25/99	NJV	Nickel 63 in Soil
				7170-006	PU		08/21/99	08/25/99	NJV	Plutonium, Isotopic in Solids
				7170-006	SR		08/16/99	08/24/99	NJV	Total Strontium in Soil
				7170-006	TC		08/20/99	08/25/99	NJV	Technetium 99 in Soil
				7170-006	U		08/13/99	08/24/99	NJV	Uranium, Isotopic in Soil
Duplicate (N908036-01)	B99-076	SOLID	N908036-09	7170-009	C		08/20/99	08/25/99	NJV	Carbon 14 in Soil
105 DR			08/04/99							
			08/06/99							

PRIORITY

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 10/07/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

WORK SUMMARY, cont.

SDG 7170
Contact L.A. Johnson

Client Hanford
Contract TRB-SBB-207925
Case no SDG-H0483

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	B99-076	Americium 241 in Soil	AM/CMPLATE	3			1	1	1	6
C	B99-076	Carbon 14 in Soil	C14COXLSC	3			1	1	1	6
GAM	B99-076	Gamma Scan	GAMMAHI	3			1	1	1	6
H	B99-076	Tritium in Soil	EPA906.0	3			1	1	1	6
NI_L	B99-076	Nickel 63 in Soil	NI63LSC	3			1	1	1	6
PU	B99-076	Plutonium, Isotopic in Solids	PUPLATE	3			1	1	1	6
SR	B99-076	Total Strontium in Soil	SRTOTAL	3			1	1	1	6
TC	B99-076	Technetium 99 in Soil	TC99TRLSC	3			1	1	1	6
U	B99-076	Uranium, Isotopic in Soil	UPLATE	3			1	1	1	6
TOTALS				27			9	9	9	54

PRIORITY

Lab id TMARC
Protocol Hanford
Version Ver 1.0
Form DVD-CWG
Version 3.06
Report date 10/07/99

TMA / RICHMOND

SAMPLE DELIVERY GROUP H0483

N908036-05 Method Blank

METHOD BLANK

SDG 7170 Client/Case no Hanford SDG-H0483
Contact L.A. Johnson Contract TRB-SBB-207925

Lab sample id N908036-05 Client sample id Method Blank
Dept sample id 7170-005 Material/Matrix SOLID
SAF No B99-076

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.003	0.052	0.088	400	U	H
Technetium 99	14133-76-7	0.012	0.46	0.87	15	U	TC
Uranium 233/234	U-233/234	0.031	0.041	0.078	1.0	U	U
Uranium 235	15117-96-1	0	0.025	0.095	1.0	U	U
Uranium 238	U-238	0	0.020	0.078	1.0	U	U
Plutonium 238	13981-16-3	0.009	0.018	0.029	1.0	U	PU
Plutonium 239/240	PU-239/240	0.006	0.012	0.029	1.0	U	PU
Nickel 63	13981-37-8	0.565	1.1	1.8	30	U	NI_L
Americium 241	14596-10-2	0.004	0.024	0.039	1.0	U	AM
Total Strontium	SR-RAD	0.264	0.13	0.19	1.0	J	SR
Potassium 40	13966-00-2	U		0.96		U	GAM
Barium 133	13981-41-4	U		4.2		UX	GAM
Cobalt 60	10198-40-0	U		0.054	0.050	U	GAM
Cesium 137	10045-97-3	U		0.067	0.10	U	GAM
Europium 152	14683-23-9	U		0.14	0.10	U	GAM
Europium 154	15585-10-1	U		0.19	0.10	U	GAM
Europium 155	14391-16-3	U		0.15	0.10	U	GAM
Radium 226	13982-63-3	U		0.097	0.10	U	GAM
Radium 228	15262-20-1	U		0.27	0.20	U	GAM
Thorium 228	14274-82-9	U		0.085		U	GAM
Thorium 232	TH-232	U		0.27		U	GAM
Americium 241	14596-10-2	U		0.17		U	GAM
Uranium 238	U-238	U		6.4		U	GAM
Uranium 235	15117-96-1	U		0.20		U	GAM

105-DR FSB - Concrete

QC-BLANK 31522

PRIORITY

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 10/07/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

N908036-08 **Method Blank**

METHOD BLANK

SDG 7170	Client/Case no Hanford	SDG-H0483	
Contact L.A. Johnson	Contract TRB-SBB-207925		
Lab sample id N908036-08	Client sample id Method Blank		
Dept sample id 7170-008	Material/Matrix	SOLID	
	SAF No B99-076		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	0.664	2.5	4.2	50	U	C

105-DR FSB - Concrete

QC-BLANK 31627

PRIORITY

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/07/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

N908036-04

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7170 Client/Case no Hanford SDG-H0483
Contact L.A. Johnson Case no TRB-SBB-207925

Lab sample id N908036-04 Client sample id Lab Control Sample
Dept sample id 7170-004 Material/Matrix SOLID
SAF No B99-076

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	7.21	0.17	0.088	400	J	H	7.34	0.29	98	84-116	80-120
Technetium 99	41.8	1.4	0.66	15		TC	43.6	1.7	96	84-116	80-120
Uranium 233/234	4.82	0.58	0.28	1.0		U	4.83	0.19	100	80-120	80-120
Uranium 235	4.22	0.53	0.073	1.0		U	3.92	0.16	108	77-123	80-120
Uranium 238	4.85	0.58	0.27	1.0		U	5.24	0.21	93	81-119	80-120
Plutonium 238	11.3	0.89	0.033	1.0		PU	12.6	0.50	90	86-114	80-120
Plutonium 239/240	12.1	0.95	0.033	1.0		PU	13.2	0.53	92	86-114	80-120
Nickel 63	137	4.6	2.9	30		NI_L	134	5.4	102	83-117	
Americium 241	10.3	0.87	0.043	1.0		AM	11.5	0.46	90	86-114	80-120
Total Strontium	13.1	0.83	0.58	1.0		SR	12.5	0.50	105	80-120	
Barium 133	U		6.6		UX	GAM					
Cobalt 60	3.63	0.25	0.14	0.050		GAM	3.94	0.16	92	76-124	80-120
Cesium 137	4.00	0.19	0.12	0.10		GAM	4.21	0.17	95	77-123	80-120

105-DR FSB - Concrete

QC-LCS 31521

PRIORITY

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 10/07/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

N908036-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7170
Contact L.A. Johnson

Client/Case no Hanford SDG-H0483
Case no TRB-SBB-207925

Lab sample id N908036-07
Dept sample id 7170-007

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B99-076

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Carbon 14	9130	180	31	50		C	10300	410	89	85-115	

105-DR FSB - Concrete

QC-LCS 31626

PRIORITY

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 10/07/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

N908036-06 B0W3Y9

DUPLICATE

SDG 7170 Client/Case no Hanford SDG-H0483
Contact L.A. Johnson Case no TRB-SBB-207925

DUPLICATE		ORIGINAL	
Lab sample id N908036-06	Lab sample id N908036-01	Client sample id B0W3Y9	
Dept sample id 7170-006	Dept sample id 7170-001	Location/Matrix 105 DR	SOLID
	Received 08/06/99	Collected 08/04/99 09:35	
		Custody/SAF No B99-076-05	B99-076

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Tritium	4.63	0.19	0.15	400	J	H	4.56	0.19	0.15	J	2	23
Technetium 99	1.14	0.19	0.29	15	J	TC	0.620	0.19	0.39	J	59	51
Uranium 233/234	1.24	0.23	0.076	1.0		U	1.34	0.22	0.068		8	38
Uranium 235	0.086	0.058	0.073	1.0	J	U	0.077	0.052	0.066	J	11	144
Uranium 238	1.23	0.23	0.061	1.0		U	1.20	0.21	0.054		2	40
Plutonium 238	5.24	0.49	0.037	1.0		PU	4.99	1.3	0.32		5	42
Plutonium 239/240	227	16	0.060	1.0		PU	232	47	0.45		2	34
Nickel 63	7790	78	6.7	30		NI_L	7580	76	6.3		3	21
Americium 241	76.1	12	0.29	1.0		AM	75.5	5.4	0.042		1	28
Total Strontium	2720	89	4.3	1.0		SR	2710	100	7.6		0	22
Potassium 40	U		21		U	GAM	U		6.4	U	-	
Barium 133	U		7.0		UX	GAM	U		2.6	UX	-	
Cobalt 60	284	5.6	3.1	0.050		GAM	281	2.0	0.99		1	32
Cesium 137	8090	20	6.6	0.10		GAM	7790	7.0	2.5		4	32
Europium 152	959	20	22	0.10		GAM	987	7.3	8.0		3	32
Europium 154	242	12	10	0.10		GAM	226	4.1	3.3		7	33
Europium 155	U		15	0.10	U	GAM	13.4	2.6	3.8		11	164
Radium 226	U		8.6	0.10	U	GAM	U		3.1	U	-	
Radium 228	U		16	0.20	U	GAM	U		6.1	U	-	
Thorium 228	U		7.3		U	GAM	U		2.9	U	-	
Thorium 232	U		16		U	GAM	U		6.1	U	-	
Americium 241	87.9	12	16			GAM	108	1.8	2.3		21	37
Uranium 238	U		610		U	GAM	U		260	U	-	
Uranium 235	U		18		U	GAM	U		6.0	U	-	

105-DR FSB - Concrete

QC-DUP#1 31523

PRIORITY

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 10/07/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

N908036-09 B0W3Y9

DUPLICATE

SDG 7170 Client/Case no Hanford SDG-H0483
Contact L.A. Johnson Case no TRB-SBB-207925

DUPLICATE	ORIGINAL	
Lab sample id N908036-09	Lab sample id N908036-01	Client sample id B0W3Y9
Dept sample id 7170-009	Dept sample id 7170-001	Location/Matrix 105 DR SOLID
	Received 08/06/99	Collected 08/04/99 09:35
		Custody/SAF No B99-076-05 B99-076

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALIFIERS	RPD %	3σ PROT TOT LIMIT
Carbon 14	160	5.2	4.4	50		C	259	6.4	4.6		47	23

105-DR PSB - Concrete

QC-DUP#1 31628

PRIORITY

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 2.06
Report date 10/07/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

N908036-01 B0W3Y9

DATA SHEET

SDG 7170 Client/Case no Hanford SDG-H0483
Contact L.A. Johnson Contract TRB-SBB-207925

Lab sample id N908036-01 Client sample id B0W3Y9
Dept sample id 7170-001 Location/Matrix 105 DR SOLID
Received 08/06/99 Collected 08/04/99 09:35
Custody/SAF No B99-076-05 B99-076

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	4.56	0.19	0.15	400	J	H
Carbon 14	14762-75-5	259	6.4	4.6	50		C
Technetium 99	14133-76-7	0.620	0.19	0.39	15	J	TC
Uranium 233/234	U-233/234	1.34	0.22	0.068	1.0		U
Uranium 235	15117-96-1	0.077	0.052	0.066	1.0	J	U
Uranium 238	U-238	1.20	0.21	0.054	1.0		U
Plutonium 238	13981-16-3	4.99	1.3	0.32	1.0		PU
Plutonium 239/240	PU-239/240	232	47	0.45	1.0		PU
Nickel 63	13981-37-8	7580	76	6.3	30		NI_L
Americium 241	14596-10-2	75.5	5.4	0.042	1.0		AM
Total Strontium	SR-RAD	2710	100	7.6	1.0		SR
Potassium 40	13966-00-2	U		6.4		U	GAM
Barium 133	13981-41-4	U		2.6		UX	GAM
Cobalt 60	10198-40-0	281	2.0	0.99	0.050		GAM
Cesium 137	10045-97-3	7790	7.0	2.5	0.10		GAM
Europium 152	14683-23-9	987	7.3	8.0	0.10		GAM
Europium 154	15585-10-1	226	4.1	3.3	0.10		GAM
Europium 155	14391-16-3	13.4	2.6	3.8	0.10		GAM
Radium 226	13982-63-3	U		3.1	0.10	U	GAM
Radium 228	15262-20-1	U		6.1	0.20	U	GAM
Thorium 228	14274-82-9	U		2.9		U	GAM
Thorium 232	TH-232	U		6.1		U	GAM
Americium 241	14596-10-2	108	1.8	2.3			GAM
Uranium 238	U-238	U		260		U	GAM
Uranium 235	15117-96-1	U		6.0		U	GAM

PRIORITY

105-DR FSB - Concrete

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 10/07/99

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

N908036-02 B0W400

DATA SHEET

SDG 7170 Client/Case no Hanford SDG-H0483
Contact L.A. Johnson Contract TRB-SBB-207925

Lab sample id N908036-02 Client sample id B0W400
Dept sample id 7170-002 Location/Matrix 105 DR SOLID
Received 08/06/99 Collected 08/04/99 09:25
Custody/SAF No B99-076-05 B99-076

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	5.97	0.14	0.072	400	J	H
Carbon 14	14762-75-5	174	5.5	4.6	50		C
Technetium 99	14133-76-7	1.06	0.30	0.39	15	J	TC
Uranium 233/234	U-233/234	2.24	0.32	0.074	1.0		U
Uranium 235	15117-96-1	0.207	0.096	0.072	1.0	J	U
Uranium 238	U-238	1.86	0.29	0.074	1.0		U
Plutonium 238	13981-16-3	2.58	0.26	0.031	1.0		PU
Plutonium 239/240	PU-239/240	163	11	0.049	1.0		PU
Nickel 63	13981-37-8	4680	47	5.4	30		NI_L
Americium 241	14596-10-2	50.7	3.4	0.044	1.0		AM
Total Strontium	SR-RAD	4700	130	8.6	1.0		SR
Potassium 40	13966-00-2	U		5.7		U	GAM
Barium 133	13981-41-4	U		3.5		UX	GAM
Cobalt 60	10198-40-0	193	1.8	0.93	0.050		GAM
Cesium 137	10045-97-3	11000	10	3.5	0.10		GAM
Europium 152	14683-23-9	548	8.5	10	0.10		GAM
Europium 154	15585-10-1	113	3.4	3.1	0.10		GAM
Europium 155	14391-16-3	9.43	3.6	5.6	0.10		GAM
Radium 226	13982-63-3	U		4.1	0.10	U	GAM
Radium 228	15262-20-1	U		5.2	0.20	U	GAM
Thorium 228	14274-82-9	U		3.7		U	GAM
Thorium 232	TH-232	U		5.2		U	GAM
Americium 241	14596-10-2	100	5.3	7.6			GAM
Uranium 238	U-238	U		150		U	GAM
Uranium 235	15117-96-1	U		7.6		U	GAM

105-DR FSB - Concrete

PRIORITY

Lab id TMANC
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TMA/RICHMOND

SAMPLE DELIVERY GROUP H0483

N908036-03 B0W401

DATA SHEET

SDG 7170 Client/Case no Hanford SDG-H0483
Contact L.A. Johnson Contract TRB-SBB-207925

Lab sample id N908036-03 Client sample id B0W401
Dept sample id 7170-003 Location/Matrix 105 DR SOLID
Received 08/06/99 Collected 08/04/99 09:09
Custody/SAF No B99-076-05 B99-076

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	6.46	0.15	0.073	400	J	H
Carbon 14	14762-75-5	3300	67	16	50		C
Technetium 99	14133-76-7	1.94	0.28	0.44	15	J	TC
Uranium 233/234	U-233/234	1.70	0.26	0.079	1.0		U
Uranium 235	15117-96-1	0.139	0.070	0.067	1.0	J	U
Uranium 238	U-238	2.61	0.34	0.069	1.0		U
Plutonium 238	13981-16-3	6.83	0.58	0.041	1.0		PU
Plutonium 239/240	PU-239/240	187	13	0.047	1.0		PU
Nickel 63	13981-37-8	10000	100	7.2	30		NI_L
Americium 241	14596-10-2	71.8	16	0.40	1.0		AM
Total Strontium	SR-RAD	3280	120	11	1.0		SR
Potassium 40	13966-00-2	U		6.5		U	GAM
Barium 133	13981-41-4	U		1.9		UX	GAM
Cobalt 60	10198-40-0	720	2.3	1.1	0.050		GAM
Cesium 137	10045-97-3	7540	5.0	1.9	0.10		GAM
Europium 152	14683-23-9	1280	6.0	5.9	0.10		GAM
Europium 154	15585-10-1	302	3.8	3.3	0.10		GAM
Europium 155	14391-16-3	12.4	1.8	3.0	0.10		GAM
Radium 226	13982-63-3	U		2.5	0.10	U	GAM
Radium 228	15262-20-1	U		5.5	0.20	U	GAM
Thorium 228	14274-82-9	U		1.9		U	GAM
Thorium 232	TH-232	U		5.5		U	GAM
Americium 241	14596-10-2	50.2	2.4	3.6			GAM
Uranium 238	U-238	U		200		U	GAM
Uranium 235	15117-96-1	U		4.8		U	GAM

PRIORITY

105-DR FSB - Concrete

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 10/07/99

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector Fahlberg/Nielson	**Company Contact** J Adler	**Telephone No.** 373-4316	**Project Coordinator** TRENT, SJ
Project Designation 105-DR FSB - Concrete	**Sampling Location** 105 DR		**SAF No.** B99-076
Ice Chest No. ERC 99-002	**Field Logbook No.** EL 1281		**Method of Shipment** Fed Ex
Shipped To TMA/REGRA R. F. 8-2-99	**Offsite Property No.** NA		**Bill of Lading/Air Bill No.** NA
			COA R105D4-2870

Price Code 9K **Data Turnaround** 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

Preservation	None											
Type of Container	G											
No. of Container(s)	1											
Volume	120mL											
SAMPLE ANALYSIS	See item (I) in Special Instructions.											

Sample No.	Matrix *	Sample Date	Sample Time									
1 B0W3Y9	Other Solid	8-4-99	0935	X						M.G	epM 1400	B0W0Y6
1 B0W400	Other Solid	8-4-99	0925	X							epM 1500	B0W0Y7
1 B0W401	Other Solid	8-4-99	0909	X							epM 1700	B0W0Y8

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	8-4-99	Ref 1-C	8-4-99 1400
Ref 1-C	8-5-99 0800	R. Fahlberg / R. Fahlberg	8-5-99 0800
R. Fahlberg / R. Fahlberg	8-5-99 1400	Fed Ex	8/5-99
FedEx	8-6-99 11:30	TNV M. Goldenberg	8-6-99 11:30

SPECIAL INSTRUCTIONS

(I) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Americium-241; Strontium-89,90 -- Total Sr; Technetium-99; Nickel-63; Carbon-14; Tritium - H3

PRIORITY

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	**Received By**	**Title**	**Date/Time**
FINAL SAMPLE DISPOSITION	**Disposal Method**	**Disposed By**	**Date/Time**